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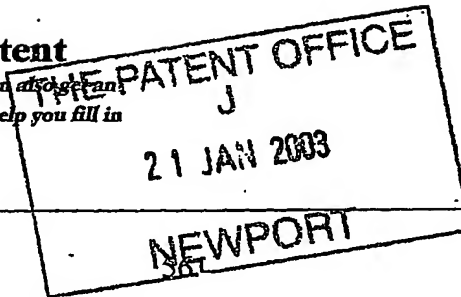


21JAN03 E718478-1 C12133  
P01/7700 00-0301280.4

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# Request for grant of a patent

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The Patent Office

Cardiff Road  
Newport  
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NP10 8QQ

1. Your reference

2. Patent application number

(The Patent Office will fill in this part)

0301280.4

21 JAN 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

SOLION LIMITED  
SOUTHBANK TECHNOPARK  
90 LONDON ROAD  
LONDON SE1 6LN  
GB

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

£ 8547069.001

4. Title of the invention

MOUNTING

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

COHEN, ALAN NICOL  
2 GROVE PLACE  
TATSFIELD  
Nr. WESTERHAM  
KENT  
TN16 2BB

Patents ADP number (if you know it)

6963557001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

YES

# Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

Claim(s)

Abstract

Drawing(s)

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date 22/01/03

12. Name and daytime telephone number of person to contact in the United Kingdom

A. N. COHEN

01959 577172

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DUPLICATE

- 1 -

## Mounting

The present invention relates to a mounting for solar panels which can be used on roofs etc.

5

Building Integrated Photovoltaics (BIPV) is a rapidly growing industry worldwide (about 25% growth annually). BIPV involves solar modules mounted on buildings and the DC electricity generated fed to the national grid through DC/AC inverters.

10 Many existing systems require structural changes to the roof or penetration of the roof which can lead to leaks and can be difficult to install involving building work.

We have now devised a modular mounting for solar panels which overcomes these difficulties and which by assembling modules together can be form an integrated  
15 solar array of any size.

According to the invention there is provided a mounting for solar panels which mounting comprises a frame having a recess for receiving solar panels, the frame having a front edge and a rear edge in which the front edge is narrower than the rear  
20 edge and the front edge of one frame is adapted to fit beneath and inside the rear edge of another frame and to be attached to the said other frame, the frame having side fixing means so that a plurality of frames can be attached to each other in a side-by-side arrangement and the frame sloping upwards from the front to the back.

25 Front, back, side and top refer to the frame when the frame is laid on a flat surface with the recess uppermost.

In use a solar panel or solar panels are placed in the recess in the frame so that sunlight can impinge on the solar panels. To cover a larger area a plurality of frames  
30 are connected together with the front edge of one frame fitting within and connected

to the rear edge of another frame and/or frames being connected side by side. In this way any size of area can be covered with solar panels.

5 Preferably the frame is made by vacuum forming of a plastics material e.g. a recycled plastic.

The angle of slope of the mounting is preferably 5 to 20 degrees e.g. about 10 degrees and can be achieved by having a wedge shaped side piece attached to each side or under the mounting so the mounting has a wedge shape.

10

The recess in the top of the mounting preferably is of a size to allow a standard solar panel module to fit into the recess and preferably the top of the solar module is flush with the top surface of the mounting.

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15 Preferably there is space in the recess to accommodate the solar panel junction box on the underneath of the solar module containing solar panels, with holes for wiring from the junction box to inside the mounting.

20 The solar panel module can be fixed to the mounting with either rivets or self-tapping screws through the underside of the mounting

The back of the mounting preferably has an opening and a lip so that the front thinner end thin end of another mounting can be inserted into the opening and fixed in place e.g. by riveting or screwing in place.

25

This can be done with a number of mountings so that a row of interlocked mountings can be assembled. The design and size of the ends preferably minimises the shading effect of the back end on the solar panel in the next mounting module in the line.

5 The side fixing means of each frame enables the mountings to be attached to each other, these fixing means can be of a conventional type e.g. with the attachment means on one side being smaller than on the other side allowing them to be interlocked with the fixing means on adjacent mountings. Preferably the fixing means are hollow so that the cables etc. from the solar modules can be fed into each mounting without being seen and out of touch.

10 The mountings can be attached to each other by any fixing means e.g. by riveting or screwing to each other.

By attaching mountings to each other in columns and rows a completely interlocked solar array can be assembled of any size and there could be many hundreds of interlocked mountings making a complete installation.

15 In order to allow more secure fixing the front end of the wedge shaped mounting preferably has a flange to allow a covering to be overlapped with the flange so that the front of the flange is firmly held to a surface. This gives final security in case of high winds and 'traps' the interlocked array.

20 In an array preferably the outer mountings of the assembled interlocked array have additional 'caps' riveted or screwed through the sides and back thick wedge end to cover the holes and provide a flange for the floor covering to overlap ensuring the array is 'trapped' on all sides, thus minimising possible lift of the array due to high winds.

25 In use the wires from each solar module in a mounting can be connected to other solar modules to enable the electricity generated to be led a way. The connections can be in parallel and/or series to produce the optimum current and voltage.

It is a feature of the mounting of the present invention that flush modules in the mounting give an integrated appearance, it is easy to install so eliminating time spent on building work, it is low cost and is fast to install without highly skilled labour, reducing labour cost and is easy to disassemble so repairs and roof maintenance can be carried out. When assembled the interlocking of the mounting ensures the complete solar array is one assembled 'block' and edge covering and interlocking ensures safety in high winds.

The mounting can easily be made from recycled plastics materials e.g. by vacuum forming.

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As well as being mounted on roofs an array can easily be mounted anywhere and is specifically designed for use with flat roofs; the modular arrangement enables shapes other than rectangular to be more nearly filled with solar panels.

For the Northern hemisphere the mounting will be orientated towards the south to maximize energy collection.

The invention is illustrated in the drawings in which: -

- Fig. 1a shows a rear view of a mounting
- Fig. 1 b shows a plan view
- Fig. 2 shows a schematic view
- Fig. 3a shows the front fixing to surface
- Fig. 3b shows a side view
- Fig. 4 shows a plan view of an assembled array

Referring to the drawings a mounting has a frame (1) with a recess into which a solar panel array (5) fits. The mounting has a front edge flange (2) and a rear edge (8). The distance A is less than the distance B and there are fixing holes for rivets or screws at

- (6) and (7) and side interlocking fixings (4a) and (4b). As can be seen in fig. 1a the rear edge (8) is in the form of an opening so that the front flange (2) of another mounting can fit into the opening and the mountings held together by rivets or screws passing through (6) and (7). This is shown more clearly in fig. 3b in which the solar module (5) fits into the recess (9) so the top of the panel is flush with the top of the recess. The cables (11) pass out through side fixing (4a). In fig. 3a the front flange (2) is positioned under a mat (15) which is attached to a roof surface (12) to hold the front flange (2) firmly in place.
- 10 To assemble the array shown in fig. 4 a number of modules are interlocked with the front edge flange of one mounting fitting into the rear opening of another mounting as shown in detail in fig. 3b. The side fixings (4a) and (4b) are interconnected to lock the mountings together to form a continuous interlocked module. The cables of the solar panels are connected together in the appropriate way and the whole array
- 15 assembled for use.

## Claims

1. A mounting for solar panels which mounting comprises a frame having a recess for receiving at least one solar panel, the frame having a front edge and a rear edge in which the front edge is narrower than the rear edge and the front edge of one frame is adapted to fit beneath and inside the rear edge of another frame and to be attached to the said other frame, the frame having side fixing means so that a plurality of frames can be attached to each other in a side-by-side arrangement and the frame sloping upwards from the front to the back.
2. A mounting as claimed in claim 1 in which the frame is made by vacuum forming of a plastics material.
3. A mounting as claimed in claim 1 or 2 in which the angle of slope of the mounting is 5 to 20 degrees.
4. A mounting as claimed in claim 1 or 2 in which the angle of slope of the mounting about 10 degrees.
5. A mounting as claimed in any one of the preceding claims in which the recess in the top of the mounting is of a size to allow a standard solar panel module to fit into the recess with the top of the solar module flush with the top surface of the mounting.
6. A mounting as claimed in any one of the preceding claims in which there is space in the recess to accommodate the solar panel junction box on the underneath of the solar panel.
7. A mounting as claimed in any one of the preceding claims in which the back of the mounting has an opening and a lip so that the front end of another mounting can be inserted into the opening and fixed in place

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8. A mounting as claimed in any one of the preceding claims in which the front end of the frame has a flange to allow a covering to be overlapped with the flange so that the front of the flange is firmly held to a surface.

5

9. A solar array comprising a plurality of mountings as claimed in any one of the preceding claims containing solar panels in which mountings are connected together.

- 8 -

### Abstract

A mounting for solar panels has fixings which enable it to be easily attached to other mountings for a solar array and can be made of recycled plastic by vacuum forming.

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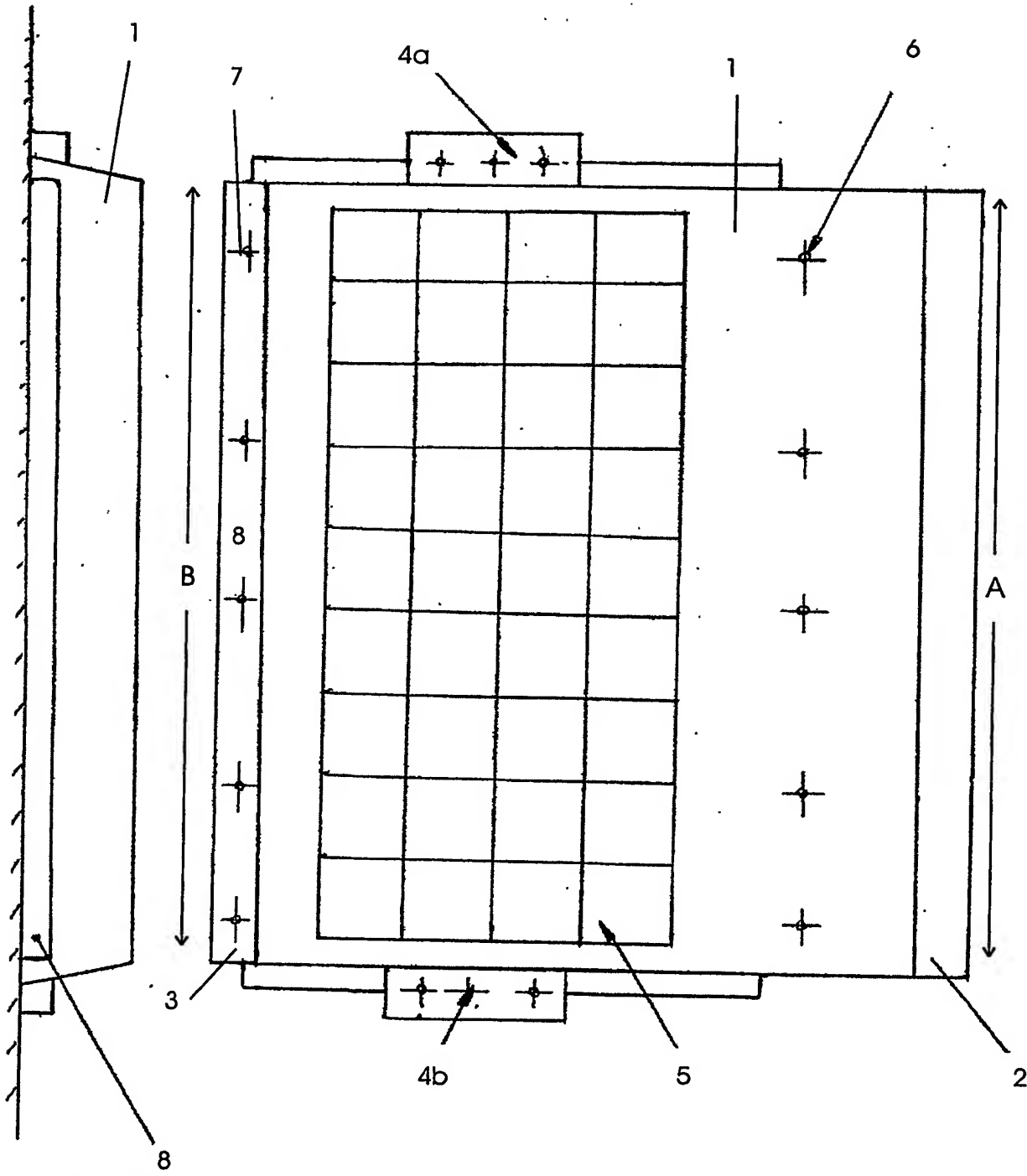


Fig. 1a

Fig. 1b

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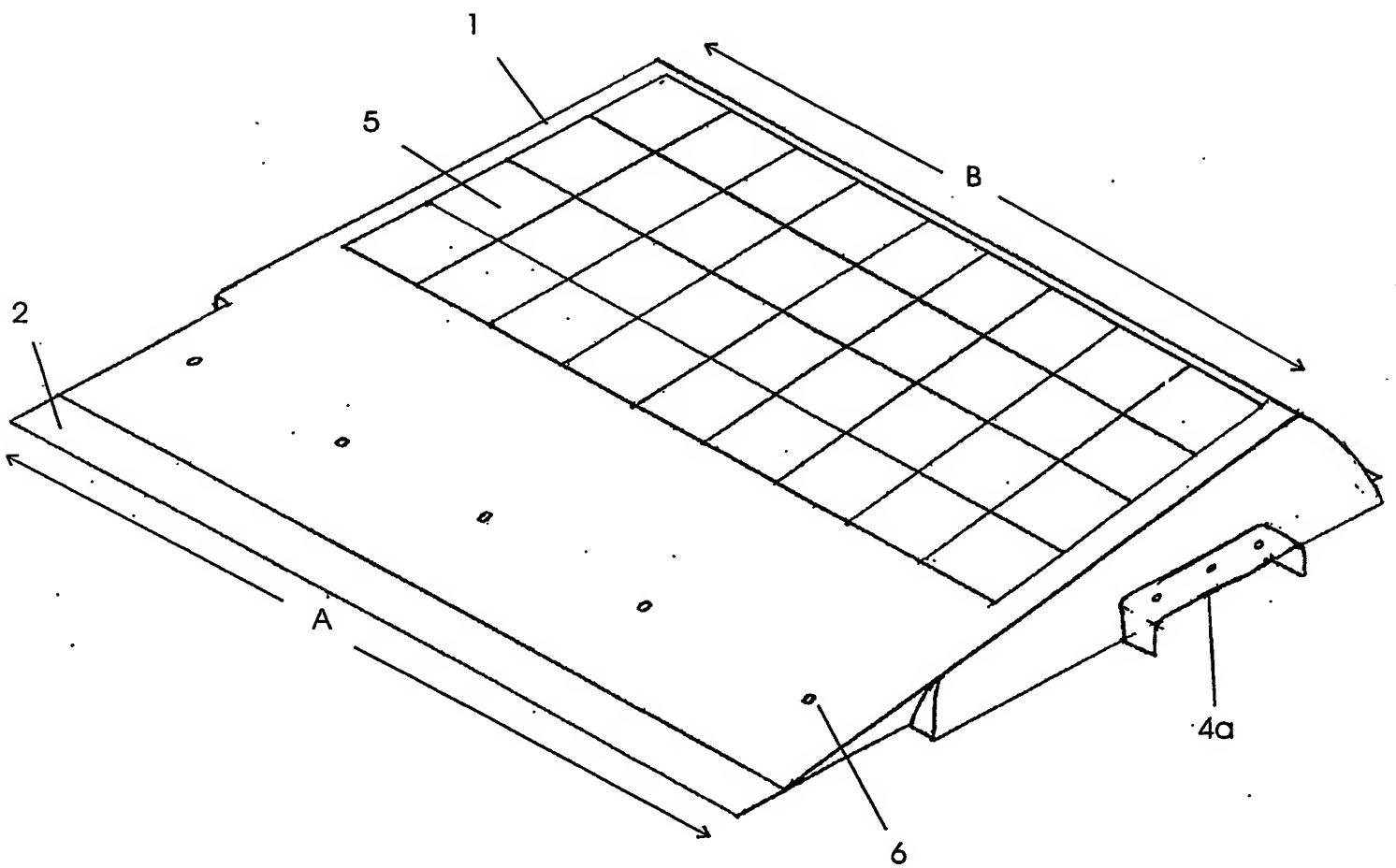


Fig. 2

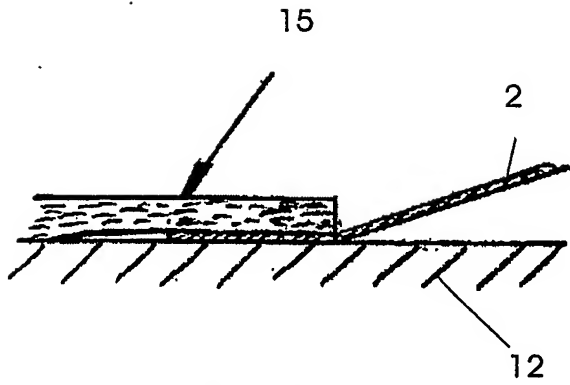


Fig. 3a

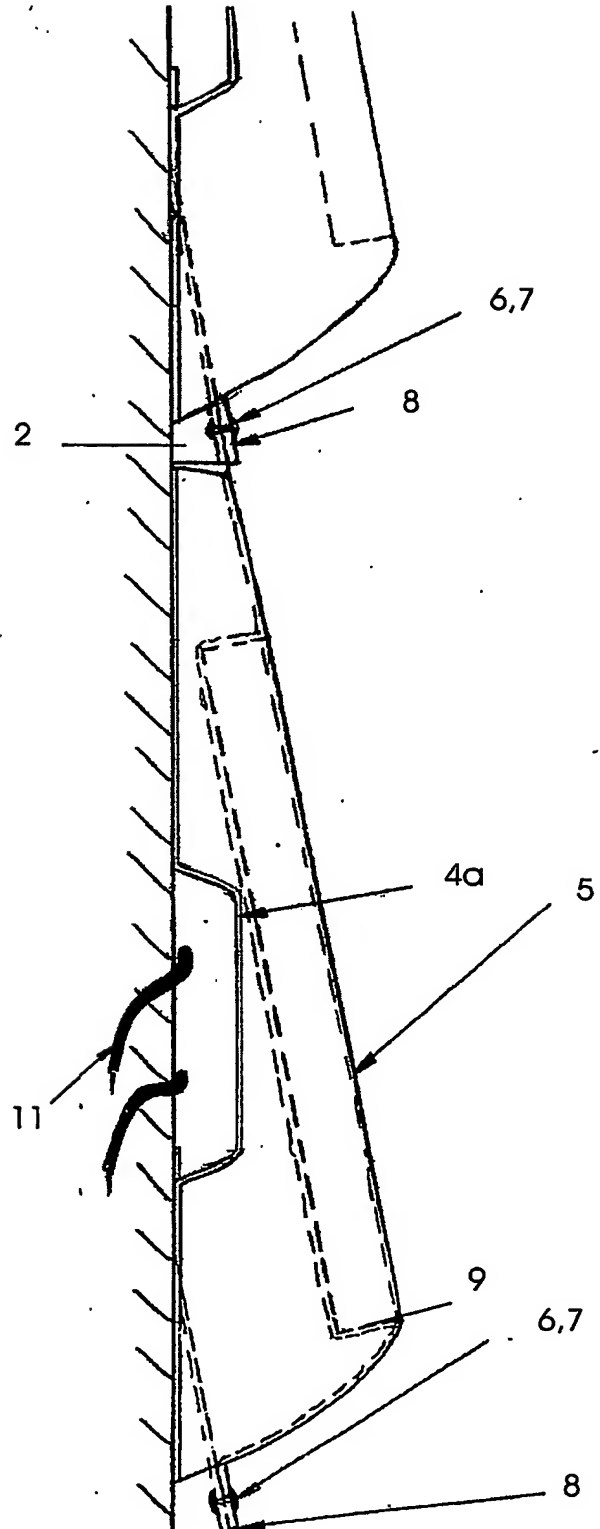


Fig. 3b

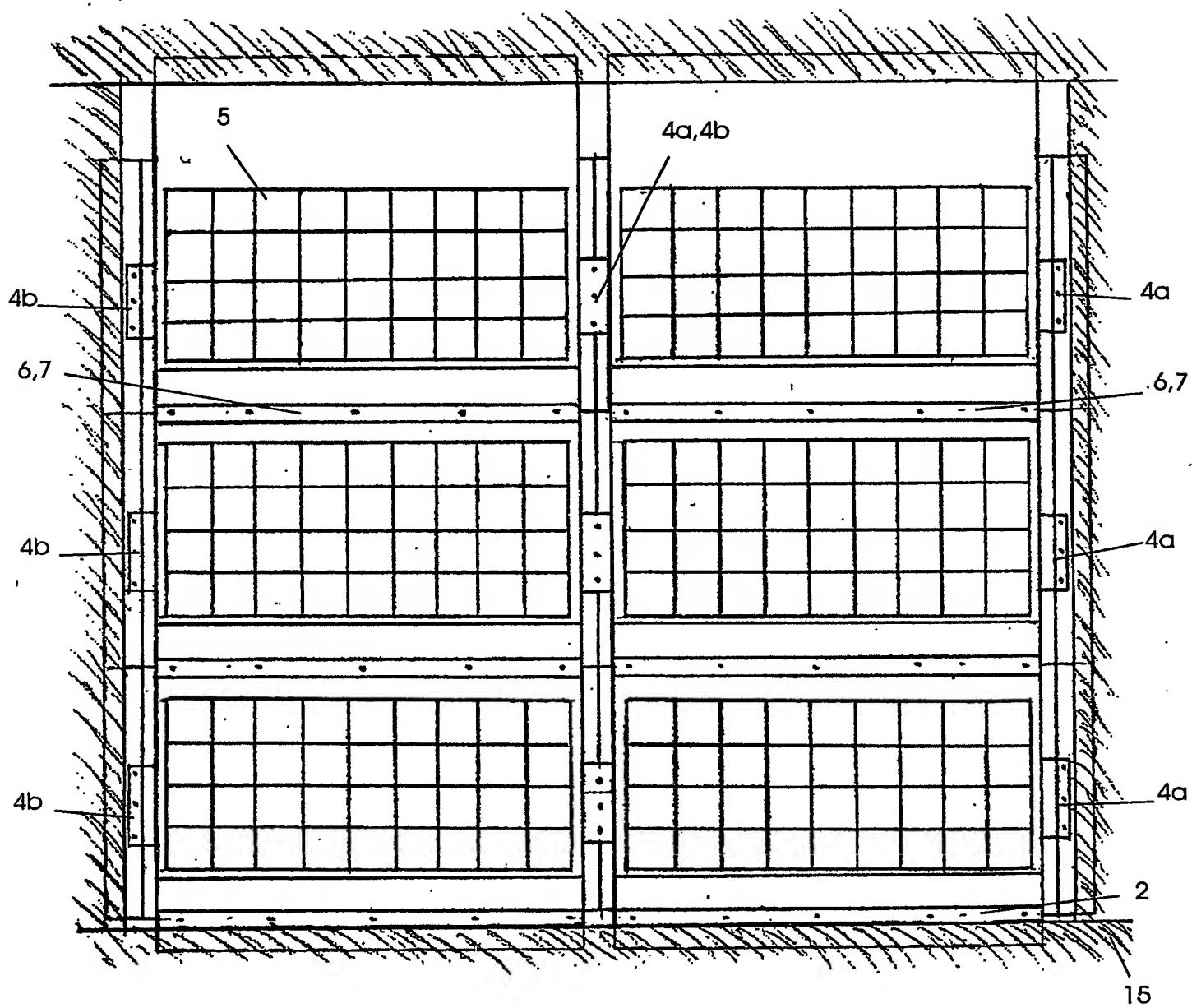
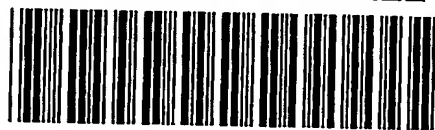


Fig. 4



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PCT Application  
PCT/GB2004/000222



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